

November 8, 2018

10 CFR 72.75(d)(1)
10 CFR 72.75(g)

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Subject: **Docket No. 72-41, 72-1640**
LER 2018-001-0, Spent Nuclear Fuel Canister Temporarily Wedged in Dry Cask
Storage Container
San Onofre Nuclear Generating Station (SONGS), Independent Spent Fuel
Storage Installation

Dear Sir or Madam:

Attached is Licensee Event Report (LER) 2018-001-0, Spent Nuclear Fuel Canister Temporarily Wedged in Dry Cask Storage Container. The LER is being submitted in accordance with 10 CFR 72.75(g) for the notification made in accordance with 10 CFR 72.75(d)(1) for the SONGS Independent Spent Fuel Storage Installation on September 14, 2018.

This letter does not contain any regulatory commitments.

If you have any questions regarding the attached report, please call Mr. Al Bates at (949) 368-6945.

Sincerely,

Lou Bosch

Attachment: LER 2018-001-0

cc: K. Kennedy, Regional Administrator, NRC Region IV
M. G. Vaaler, NRC Project Manager, San Onofre Units 1, 2 and 3
W.C. Allen, NRC Project Manager, SONGS ISFSI

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LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. Facility Name

San Onofre Nuclear Generating Station ISFSI

2. Docket Number

07200041

3. Page

1 OF 4

4. Title Spent Nuclear Fuel Canister Temporarily Wedged in Dry Cask Storage Container

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
08	03	2018	2018	- 001	0				Facility Name	Docket Number
										05000
									Facility Name	Docket Number
										05000

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
N/A	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. Power Level	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(iii)
		☐ 50.73(a)(2)(i)(C)	☒ Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER

Licensee Contact

A.E. Bates, Manager, Regulatory Affairs and Nuclear Oversight

Telephone Number (Include Area Code)

(949) 368-6945

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To ICES	Cause	System	Component	Manufacturer	Reportable To ICES

14. Supplemental Report Expected

☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No

15. Expected Submission Date

Month Day Year

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

San Onofre Nuclear Generating Station (SONGS) is permanently defueled and is in the process of transferring spent nuclear fuel to dry cask storage in the Independent Spent Fuel Storage Installation (ISFSI). On Friday, August 3, 2018, at approximately 12:45 PDT, as vendor contract personnel were lowering a canister containing spent nuclear fuel into an underground dry storage vault, the canister became temporarily wedged between a shield ring within the vault's inner liner and the transfer cask; a condition that did not comply with the regulatory requirements for redundant drop protection features. The condition was corrected at approximately 13:41 PDT by lifting the canister off the shield ring. The canister was safely lowered into the dry cask storage vault at 14:14 PDT.

This is a 10 CFR 72.75(g) follow-up report to the event notification previously made under 10 CFR 72.75(d)(1), "An event in which important to safety equipment is disabled or failed to function as designed. . . ." The condition resulted from human performance issues. Corrective actions to address programmatic issues, including training, and equipment modifications, will be completed prior to resuming the spent fuel campaign. At no time during this event was there an impact on the health and safety of plant personnel, or the public.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
San Onofre Nuclear Generating Station	072000-41	2018	- 001	- 0

Narrative**A. Reportable Occurrence**

On Friday, August 3, 2018, at approximately 12:45 PDT, vendor personnel from Holtec International under contract to Southern California Edison (SCE), were lowering a Multi-Purpose Canister (MPC) into a dry storage vault within the Independent Spent Fuel Storage Installation (ISFSI). As it was lowered, the MPC came to rest on top of the shield ring and against the inner wall of the transfer cask. With the MPC supported by the shield ring, the crane [EIS Code: CRN] and supporting rigging became unloaded, contrary to the requirements of the Technical Specifications contained in the Holtec Certificate of Compliance (CoC) 72-1040. The condition was corrected at approximately 13:41 PDT by lifting the MPC from the shield ring. The MPC was safely lowered into storage at 14:14 PDT, and radiation levels were normal in the area.

B. Initial Conditions

Both units at San Onofre Nuclear Generating Station (SONGS) were permanently defueled (Unit 2 on July 24, 2013, Unit 3 on June 28, 2013). The MPC contains thirty-seven spent nuclear fuel assemblies that were being moved from storage in the Unit 2 spent fuel pool to dry cask storage in the ISFSI.

C. Background Information

Holtec International (Holtec) was hired by SCE in 2014 to provide an expanded ISFSI and services for the storage of the spent nuclear fuel from SONGS Units 2 and 3. The ISFSI design employs the Holtec HI-STORM UMAX dry storage vault system. The HI-STORM system stores the spent nuclear fuel in an underground storage vault, protected from the environment, and utilizes passive, natural circulation cooling. Spent fuel assemblies are loaded into the stainless steel MPC in the fuel storage pool, located within the SONGS plant facility. The MPC cylinder is then removed from the pool, dried, filled with a helium cover gas, and all confinement boundary locations are seal welded. A HI-TRAC transfer cask provides shielding and support for the MPC during transit to the ISFSI. A mobile Vertical Cask Transporter (VCT) places the MPC in the storage vault. The VCT is a rising hydraulic tower mobile crane, with redundant drop protection features, suspending the load from slings attached to the two towers, as opposed to a conventional gantry crane that lifts the load by winding a cable spool. The VCT is moved into position over the storage vault location, and as the towers are lowered, the MPC is lowered from the HI-TRAC transfer cask into the Cavity Enclosure Container (CEC).

The CEC provides the supporting structure for the MPC within the ISFSI concrete pad. A steel inner liner (divider shell) separates the MPC from the outer wall of the CEC, providing an annular flow path for air circulation. A steel shield ring within the inner liner is supported from above by triangular gussets welded to the divider shell. The gussets assist in centering the MPC as it is lowered into the CEC, and the shield ring reduces the radiation exposure to personnel working above the container. Careful alignment of the MPC is necessary when lowering the MPC into the CEC to clear the shield ring.

During the evolution of lowering the MPC into the storage vault, an observer (spotter) was positioned on a hydraulic lift adjacent to the VCT. The spotter was the only person positioned to directly observe the MPC as it was lowered. The VCT operator cannot directly observe the MPC and relies on information from the spotter. A Radiation Protection (RP) technician was stationed below and to the side of the ISFSI pad. Other personnel including the Cask Loading Supervisor (CLS), and Rigger In Charge (RIC)

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were restricted from entering the area to maintain the worker exposure As Low As Reasonably Achievable (ALARA) and were not in a position to observe the MPC download.

D. Description of Occurrence

On Friday, August 3, 2018, at approximately 12:45 PDT, as Holtec personnel were lowering the MPC into the storage vault, the bottom of the MPC contacted a gusset on the shield ring. The MPC tilted slightly, wedging it between the inner wall of the transfer cask and the shield ring. The VCT operator was monitoring the tower positions and was not observing the total weight of the load as it descended; consequently he did not detect that the slings were unloading. The spotter had moved the hydraulic lift for ALARA purposes without observing the MPC had stopped lowering and he was no longer positioned to directly observe the MPC movement. The spotter observed the slings had accumulated on the pad instead of the MPC, and did not recognize it was an abnormal condition. The CLS and RIC believed the MPC was lowering because from their perspective, the slings appeared to be taut.

At approximately 13:09 PDT, the RP technician reported the dose rate was elevated above normal levels, indicating the MPC had not lowered. Shortly afterwards, the Holtec Site Services Manager directed immediate action be taken place tension on the slings. At 13:30 PDT, the VCT was raised, fully lifting the MPC from the shield ring at 13:41 PDT. At 14:14 PDT, it was confirmed the MPC had been fully lowered into the storage vault. A survey of the ISFSI pad confirmed the dose rates had returned to normal.

The Holtec Certificate of Compliance (CoC) No.72-1040, Technical Specification Section 5.2 "Transport Evaluation Program," item c.3 states, "The lifting equipment shall have redundant drop protection features which prevent uncontrolled lowering of the load." Technical Specification 5.2.c.3 was not met during the approximately 54 minutes the MPC was temporarily wedged in the transfer cask above the shield ring.

SCE initially determined the event was not reportable and discussed the event with NRC Region IV on Monday, August 6, and Tuesday, August 7. After additional discussion with the NRC inspection team during the week of September 10, SCE submitted a late 24-hour non-emergency notification under 10 CFR 72.75(d)(1), "An event in which important to safety equipment is disabled or failed to function as designed when: (i) The equipment is required by regulation, license condition or the certificate of compliance to be available and operable. . . to mitigate the consequences of an accident; and (ii) No redundant equipment was available and operable to perform the required safety function." This 60-day report is submitted under 10 CFR 72.75(g), "Preparation and submission of written reports."

E. Cause Evaluation

The ISFSI team initially failed to recognize the MPC misalignment and halt the download activity. A Root Cause Evaluation (RCE) and an Apparent Cause Evaluation (ACE) were completed by Holtec and SCE, respectively.

Holtec Management did not completely recognize the complexity and risks associated with fuel transfer operation while using a relatively new Holtec HI-STORM UMAX system design when performing a long duration campaign and thus did not implement all necessary program improvements or the necessary level of oversight. Holtec failed to challenge the design of the shield ring and did not identify the potential for unintended consequences.

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SCE Oversight was not effective in preventing the event and failed to ensure Holtec provided technically accurate procedures, training to support procedure implementation, and sufficiently detailed guidance for the Oversight Specialists.

F. Corrective Actions**Completed Corrective Actions**

SCE directed Holtec to stop all work, allowing for the completion of the initial investigation and personnel briefings.

Holtec has incorporated independent experts into their design review process, expanding the review process to include members from site services and manufacturing, and will use an Independent Challenge Team to review new designs as well as changes with elevated potential consequences.

Corrective Actions

Procedural and programmatic revisions will be made, equipment modifications implemented, and revisions of the SCE Oversight program and training will be completed prior to resuming the spent fuel campaign. Additionally, enhancements will be made under the Corrective Action Program (CAP) to emphasize the importance of Operating Experience (OE) and Lessons Learned.

Continuous load monitoring equipment will be installed and utilized by the VCT operator to verify the MPC is not binding or misaligned as it is lowered into storage.

G. Safety Assessment

The MPC remained intact and was safely stored in the ISFSI. At no time during this event was there an impact on the health and safety of site personnel or the public. Calculations have shown the shield ring is structurally capable of supporting the weight of the MPC. Additionally, an analysis demonstrated the MPC confinement boundary has sufficient margin and would not be breached from a free vertical drop of twenty-five feet onto a rigid surface.

H. Additional Information – Operating Experience**SONGS**

On July 22, 2018, the MPC download into the storage vault was delayed for 1.5 hours when the VCT operator observed a reduction in load. The MPC was raised, re-aligned, and successfully placed in storage. The redundant safety features remained operable as required. The cause of the delay was not fully evaluated at that time and has since been entered into the corrective action program and incorporated into lessons learned.

Callaway

In July 2015 during a dry run, Callaway experienced contact with the shield ring and the crew realigned the MPC. A Caution Statement was added to the procedure at Callaway, however the potential for interference with the shield ring was inadequately addressed in the development of the procedures used at SONGS.